CLAIM LISTING (CLEAN VERSION)

1. (Original) A computer implemented universal broadcast method comprising the act of preparing a delivery matrix defining a data transmission sequence suitable for broadcast, to a plurality of clients, on-demand data in a non client specific manner, wherein transmission of said on-demand data files comprises a first stream including a first subset of said data transmission sequence and a second stream comprising a second subset of said data transmission sequence.

2. (Original) The computer implemented method as recited in claim 1, wherein said first subset and said second subset do not include any common data blocks.

3. (Original) The computer implemented method as recited in claim 2, wherein said first subset comprises an optimized set of data blocks, wherein said second subset is the remainder of said data transmission sequence, whereby said optimized set of data blocks is dependent on the frequency of data block distribution.

4. (Original) The computer implemented method as recited in claim 1, wherein said first stream further includes a prefetch stream identifier.

5. (Original) The computer implemented method as recited in claim 4, wherein said prefetch stream identifier signals a universal set top box to pre-load said first stream in to electronic storage onto said universal set-top-box.

6. (Original) The computer implemented method as recited in claim 4, wherein said universal set top box may load said first stream, while said universal set top box is idle.

7. (Original) The computer implemented method as recited in claim 1, wherein said first subset includes a minimum amount of data blocks needed to begin a program, whereby said minimum amount is dependent on available bandwidth.

8. (Original) The computer implemented method as recited in claim 1, wherein the ratio of said transmission sequence allocated between said first subset and said second subset is optimally configured based on the amount of transmission bandwidth available.

9. (Original) The broadcast method as recited in claim 1, whereby transmission of said on-demand data files requires an amount of transmission bandwidth that is independent of the number of said plurality of clients.

10. (Original) A computer implemented method as recited in claim 9, wherein the act of generating a delivery matrix comprises the acts of: preparing a first scheduling matrix suitable for transmission of a first data file, said first data file being represented by a first plurality of data blocks, said first scheduling matrix providing a first sequence for transmitting said first plurality data blocks sequentially within time slots in a manner such that any client receiving transmission of said first data file according to said first scheduling matrix may begin accessing said first data file within one time slot.

11. (Original) A computer implemented method as recited in claim 10 wherein said first scheduling matrix is a constant bandwidth scheduling matrix.

12. (Original) A computer implemented method as recited in claim 10 wherein said first scheduling matrix is a variable bandwidth scheduling matrix.

13. (Original) A computer implemented method as recited in claim 11 wherein a constant quantity of data from said first plurality of data blocks are scheduled for transmission during allocated bandwidth.

14. (Original) A computer implemented method as recited in claim 13 wherein control of transmission during allocated bandwidth is performed by a low level hardware device.

15. (Original) The computer implemented broadcast method a recited in claim 1, whereby said first stream is a pre-fetch stream, said pre-fetch stream accessed by a universal set top box during a set of pre-fetch receiving scenarios.

16. (Original) The computer implemented method as recited in claim 15, wherein said set of pre-fetch receiving scenarios include the activation of a pre-loading command onto said set top box by a user.

17. (Original) The computer implemented method as recited in claim 15, wherein said set of pre-fetch receiving scenarios include a pre-ordered program from the user.

18. (Withdrawn) A computer implemented method for generating a constant bandwidth, decreased idle time scheduling matrix suitable for the delivery of on-demand data in a non client specific format, said method comprising the acts of: generating a scheduling matrix suitable for transmission of a first data file, said first data file being represented by a first plurality of data blocks, said first scheduling matrix providing a first sequence for transmitting said first plurality data blocks sequentially within time slots in a manner such that any client receiving transmission of said first data file according to said first scheduling matrix may begin accessing said first data file within one time slot; determining a desired constant transmission bandwidth, wherein said constant bandwidth is then used to stream said data blocks sequentially according to the order of said first scheduling matrix; determining a correct allocation for dividing streaming data blocks into separate streams based on said constant bandwidth; and loading at least one of said separate streams onto a set top box, while set top box is not transmitting to a display device.

19. (Withdrawn) A universal set top box which performs the following functions: a. switching to an idle mode; b. accessing a pre-loading transmission stream at some time while in said idle mode; c. storing a set of data blocks in said pre-loading transmission stream on a computer readable medium; and d. retrieving a portion of said data blocks upon switching from said idle mode to an active mode and signaled by a user and displaying a first portion first program from said stored pre-loaded transmission stream; e. automatically tuning into a correct data stream, such that there is no interruption in broadcast between said first portion of said program and the remainder of said first program; whereby said retrieval step allows said user to access a program immediately without further access to broadcast data.

20. (Withdrawn) The set top box as recited in claim 19, capable of performing the additional function of periodically updating said prefetch stream while in said idle mode.

21. (Withdrawn) The set top box as reciting in claim 20, wherein said periodically updating step is dependent on a user instruction.

22. (Withdrawn) The set top box as recited in claim 20, wherein said periodically updating step is based on Video on Demand preferences.

23. (Withdrawn) The set top box as recited in claim 20, wherein said periodically updating step is based on user history.

24. (Withdrawn) The set top box as recited in claim 19, wherein said step of switching to an idle mode is performed under a set of idle mode scenarios.

25. (Withdrawn) The set top box as recited in claim 24, wherein said idle mode scenario, includes user inactivity.

26. (Withdrawn) A computer implemented method for pre-loading a set top box with broadcast data, which includes the acts of: switching said STB to a idle mode; automatically tuning said STB to said a first channel in order to select data for preprogramming said STB, said first channel including a pre-fetch data stream; processing said first plurality of data blocks as received when said user switches said STB to an active mode, said processing including at least one of the following: decoding said received data blocks; decompressing said received data blocks; re-assembling said received data blocks as necessary; and storing said received data blocks to a local memory present within said STB; and providing said first data file to an output device by said user of said universal STB.

27. (Withdrawn) The computer implemented method as recited in claim 26 wherein said output device is a television.

28. (Withdrawn) The computer implemented method as recited in claim 26 wherein said output device is a display monitor.

29. (Withdrawn) The computer implemented method as recited in claim 26 wherein said output device is a video cassette recorder (VCR).

30. (Withdrawn) The computer implemented method as recited in claim 26 wherein said output device is a computer system.

31. (Withdrawn) The computer implemented method as recited in claim 18, wherein said correct allocation is based on available bandwidth.

32. (Withdrawn) A data delivery matrix comprising a data file divided into a number of data blocks; said number of data blocks being arranged into an order determined by the steps of: a) dividing said data file into said number of data blocks; b) setting a first variable to zero; c) clearing a reference array; d) comparing said first variable to the total number of said number of

data blocks; e) if said first variable is less than the total number of said number of data blocks, set a second variable to zero; f) compare said second variable to the total number of said number of data blocks; g) if said second variable is less than the total number of said number of data blocks writing one or more stored data blocks stored in a column of a scheduling matrix into said reference array, said column determined by the $[(i+j)\bmod(x)]$ where i is said second variable, j is said first variable and x is said number of data blocks; h) if said reference array already has at least one of said stored data blocks, do not write a second copy; i) check if said reference array contains a block corresponding to said second variable; j) if said reference array does not contain said data block corresponding to said second variable, said data block is added to said reference array and said scheduling matrix at a position in said matrix equal to $[(i+j)\bmod(x),j]$ and said second variable is increased by 1; k) if said reference array does contain said data block corresponding to said second variable, said second variable is increased by 1; l) repeat steps g) through k) until said second variable is equal to said total number of data blocks; m) increase said first variable by 1; n) repeat steps c) through m) until said first variable is equal to said total number of data blocks; and o) reconfigure said scheduling matrix into a plurality of streams; wherein said order is transmitted in a repeating signal over a medium having a bandwidth assigned to said data file, and wherein said bandwidth is fully used by said repeating signal.

33. (Withdrawn) The data delivery matrix of claim 32, wherein said step of reconfiguring said scheduling matrix into a plurality of streams involves determining the size of said bandwidth assigned to said data file and determining the optimal size of a first delivery stream, whereby first delivery stream includes a beginning sequence of said data file.

34. (Withdrawn) The data delivery matrix of claim 33, wherein determining the size of said bandwidth assigned to said file minimizes said bandwidth.

35. (Withdrawn) The data delivery matrix of claim 33, wherein determining the size of said bandwidth assigned to said file maximizes said bandwidth.

36. (Withdrawn) The data delivery system as recited in claim 32, wherein said plurality of data delivery streams derived from a data delivery matrix comprises a plurality of distinct data files.

37. (Withdrawn) A computer implemented universal data broadcast method comprising the acts of: at a universal data broadcast system, performing the acts of: preparing a delivery matrix defining a data transmission sequence suitable for broadcast, to a plurality of clients, on-demand data in a non client specific manner, wherein transmission of said on-demand data comprises a first stream including a first subset of said data transmission sequence and a second stream comprising a second subset of said data transmission sequence; wherein said first stream is pre-loading transmission data; providing a first channel server suitable for the transmission of said pre-loading transmission data via a first channel; prior to data broadcast, preparing a second channel server for the transmission of an electronic program guide, said electronic program guide (EPG) including information on a third channel contains at least said second stream; and transmitting data from said first channel and said second channel; and at a universal STB, performing the acts of: receiving digital data in said first stream in said first channel while said universal STB is in a passive mode; storing said digital data in said first stream in a computer readable medium while said universal STB is in said passive mode; receiving digital data said EPG; providing said EPG data to a user of said universal STB; receiving data processing

instructions from said user of said universal STB; and implementing said instructions from said user of said universal STB.

38. (Withdrawn) A computer implemented method as recited in claim 37, wherein the act of generating a deliver matrix comprises the acts of: preparing a first scheduling matrix suitable for transmission of a first data file, said first data file being represented by a first plurality of data blocks, said first scheduling matrix providing a first sequence for transmitting said first plurality data blocks sequentially within time slots in a manner such that any client receiving transmission of said first data file according to said first scheduling matrix may begin accessing said first data file within a set number of time slots, wherein said set number is based on the number of blocks in said pre-loading stream, wherein said first data file does not include any common data blocks included in said pre-loading stream.

39. (Withdrawn) The method as recited in claim 38, further comprised of the act of prior to data broadcast, preparing a third channel server for the transmission of data-on-demand information, said preparing said third channel server including the acts retrieving said delivery matrix into a memory of said third channel server and retrieving data blocks contained within said second stream scheduled for delivery by said delivery matrix into said memory of said third channel server; and transmitting data from said third channel.

40. (Withdrawn) A computer implemented method as recited in claim 39 wherein said first scheduling matrix is a constant bandwidth scheduling matrix.

41. (Withdrawn) A computer implemented method as recited in claim 40 wherein a constant number of said first plurality of data blocks are scheduled for transmission during each time slot.

42. (Withdrawn) A computer implemented method as recited in claim 40 wherein said first scheduling matrix is a variable bandwidth scheduling matrix.

43. (Withdrawn) A data-on-demand (DOD) broadcast server method for providing DOD services suitable for broadcast to a plurality of clients, in a non-client specific manner, via a transmission medium, comprising the acts of: providing a first data stream including a plurality of first data blocks and a plurality of additional data blocks, said first data blocks and said additional data blocks comprising a selected DOD service; removing said plurality of first data blocks from said first data stream; placing at least one of said first data blocks in a second data stream; and transmitting said second data stream via said transmission medium; and transmitting said first data stream via said transmission medium, such that a user receiving said first and second data streams may combine at least a portion of said first and second data streams in order to access said selected DOD service.

44. (Withdrawn) The data-on-demand (DOD) broadcast server method of claim 43, wherein said first and second data streams are configured to be received by a set-topbox.

45. (Withdrawn) The data-on-demand (DOD) broadcast server method of claim 43, wherein said additional data blocks include a plurality of second data blocks and a plurality of third data blocks.

46. (Withdrawn) The DOD broadcast server method of claim 45, further comprising the acts of: removing said plurality of second data blocks from said first data stream; placing at least one of said second data blocks in said second data stream; and wherein a user receiving said first and second data streams may combine at least a portion of said first, second and third data blocks in order to access said selected DOD service.

47. (Withdrawn) The DOD broadcast server method of claim 45, wherein accessing said selected DOD service includes viewing a video representation of at least a portion of said DOD service.

48. (Withdrawn) A data-on-demand (DOD) broadcast reception method for accessing DOD services transmitted from a non client specific DOD broadcast server system via a DOD receiver, comprising the acts of: receiving a first data stream comprising a portion of a selected DOD service via a transmission medium; and receiving a second data stream comprising a portion of said selected DOD service via said transmission medium; and combining said first and second data streams in order to access said selected DOD service.

49. (Withdrawn) The DOD broadcast reception method of claim 48, further comprising: preloading at least a portion of said second data stream in a memory location; combining at least a portion of said preloaded data stream with at least a portion of said first data stream in order to play at least a portion of said DOD service.

50. (Withdrawn) The DOD broadcast reception method of claim 48, further comprising receiving an electronic programming guide (EPG), said EPG enabling said DOD receiver to select a DOD service to be accessed.

51. (Withdrawn) A data-on-demand (DOD) broadcast server method for providing DOD services suitable for broadcast to a plurality of clients, in a non-client specific manner, via a transmission medium, comprising the acts of: providing a decreased idle time linear sequence of data blocks containing data including a selected DOD service; removing a most frequently occurring data block from said decreased idle time sequence of data blocks; placing said removed most frequently occurring data block in a prefetch data stream such that said prefetch data stream includes prefetch data blocks corresponding to said selected DOD service; transmitting said prefetch data stream via said transmission medium; and transmitting said remaining decreased idle time sequence of data blocks via said transmission medium such that a receiving device may combine said remaining decreased idle time sequence of data blocks and said prefetch data blocks to create said selected DOD service, thereby decreasing the bandwidth necessary to transmit said DOD service.

52. (Withdrawn) The DOD broadcast server method of claim 51, wherein said prefetch data stream includes an electronic program guide (EPG), said EPG including information indicative of what services are available from said DOD broadcast server.

53. (Withdrawn) The DOD broadcast server method of claim 52, wherein said EPG enables a user to select said selected DOD service for viewing.

54. (Withdrawn) The DOD broadcast server method of claim 51, further comprising: removing a plurality of additional data blocks from said decreased idle time sequence of data blocks; placing

at least one of said plurality of additional data blocks in said prefetch data stream such that said prefetch data stream includes said most frequently occuring data blocks and said additional data blocks corresponding to said selected DOD service; and transmitting said remaining decreased idle time sequence of data blocks via said transmission medium such that a receiving device may combine said remaining decreased idle time sequence of data blocks, and said prefetch data blocks to create said selected DOD service, thereby further decreasing the bandwidth necessary to transmit said DOD service.

55. (Withdrawn) The DOD broadcast server method of claim 54, wherein said plurality of additional data blocks include a plurality of a second most frequently occurring data block, thereby further decreasing the bandwidth necessary to transmit said DOD service.

56. (Withdrawn) The DOD broadcast server method of claim 55, wherein said plurality of additional data blocks include a plurality of a third most frequently occurring data block, thereby further decreasing the bandwidth necessary to transmit said DOD service.

57. (Withdrawn) The DOD broadcast server method of claim 56, wherein said plurality of additional data blocks include a plurality of a fourth most frequently occurring data block, thereby further decreasing the bandwidth necessary to transmit said DOD service.

58. (Withdrawn) The DOD broadcast server method of claim 57, wherein said plurality of additional data blocks include a plurality of a fifth most frequently occurring data block, thereby further decreasing the bandwidth necessary to transmit said DOD service.

59. (Withdrawn) The DOD broadcast server method of claim 54, further comprising transmitting an electronic program guide (EPG), said EPG including data indicating DOD services transmitted by said DOD broadcast server and selectable by a user.

60. (Withdrawn) A data-on-demand (DOD) broadcast reception method for accessing DOD services transmitted from a non client specific DOD broadcast server system via a DOD receiver, comprising the acts of: receiving a prefetch data stream containing prefetch data blocks corresponding to a selected DOD service; storing said prefetch data blocks in a memory location; receiving a primary data stream containing primary data blocks corresponding to said selected DOD service; and processing said primary data blocks and said prefetch data bocks in order to enable a user to access said selected DOD service.

61. (Withdrawn) The data-on-demand (DOD) broadcast reception method of claim 60, further including receiving an electronic program guide (EPG) including information indicating available DOD services.

62. (Withdrawn) The data-on-demand (DOD) broadcast reception method of claim 60, further comprising: receiving user input indicative of said selected DOD service; switching to a channel corresponding to said selected DOD service in response to said user input; and receiving said primary data stream from said channel corresponding to said selected DOD service.

63. (Withdrawn) The data-on-demand (DOD) broadcast reception method of claim 62, including receiving an electronic program guide (EPG).

64. (Withdrawn) The data-on-demand (DOD) broadcast reception method of claim 63, wherein said electronic guide provides information to a user indicative of DOD services available from said DOD broadcast server.

65. (Withdrawn) The data-on-demand (DOD) broadcast reception method of claim 64, wherein said user may view a selected DOD service by selecting information received from said EPG corresponding to said selected DOD service.

66. (Withdrawn) The data-on-demand (DOD) broadcast reception method of claim 60, further comprising displaying said DOD service via a video display device.

67. (Withdrawn) A universal set-top-box (STB) capable of receiving and handling a plurality of digital services such as VOD and digital broadcast, wherein at least one of said digital services is transmitted as a plurality of independent data streams, said universal STB comprising: a databus; a first communication device suitable for coupling to a digital broadcast communications medium, said first communication device operable to receive digital data including a primary data stream and a prefetch data stream; memory bi-directionally coupled to said databus; a digital data decoder bi-directionally coupled to said databus; and a central processing unit (CPU) bi-directionally coupled to said databus, said CPU implementing a STB control process controlling said memory, said digital decoder, and said demodulator, said STB control process operable to process digital data received at said first communications device, said CPU being further operative to process said primary data stream and said prefetch data stream.

68. (Withdrawn) A universal STB as recited in claim 67, wherein said prefetch data stream is stored in said memory.

69. (Withdrawn) A universal STB as recited in claim 67, wherein said databus is a high speed databus suitable for performing data communications in a real time manner as required to accomplish real time processing of said digital data received at said first communications device.

70. (Withdrawn) A universal STB as recited in claim 67, wherein said databus is a USB databus.

71. (Withdrawn) A universal STB as recited in claim 67, wherein said databus is a firewire databus.

72. (Withdrawn) A universal STB as recited in claim 67, wherein said memory includes a mass storage device.

73. (Withdrawn) A universal STB as recited in claim 72 wherein said mass storage device is a hard disk.

74. (Withdrawn) A universal STB as recited in claim 67 wherein said memory includes high speed buffer memory.

75. (Withdrawn) A universal STB as recited in claim 74 wherein said high speed buffer memory is random access memory (RAM).

76. (Withdrawn) A universal STB as recited in claim 67 wherein said digital data decoder has video and audio decoding capabilities.

77. (Withdrawn) A universal STB as recited in claim 67, wherein said digital data decoder is an MPEG decoder.

78. (Withdrawn) A universal STB as recited in claim 67 wherein said digital data decoder supports a variety of digital data commands including play, stop, pause, step, rewind, and forward.

79. (Withdrawn) A universal STB as recited in claim 67 wherein said first communication device includes a demodulator.

80. (Withdrawn) A universal STB as recited in claim 67 wherein said demodulator is a QAM demodulator.

81. (Withdrawn) A universal STB as recited in claim 67 wherein said first communication device is a cable modem.

82. (Withdrawn) A universal STB as recited in claim 67 wherein said CPU implements a user interface driver suitable for interpreting commands received from a user interface coupled to said databus.

83. (Withdrawn) A universal STB as recited in claim 82, wherein said user interface includes a remote control device.

84. (Withdrawn) A universal STB as recited in claim 82, wherein said user interface includes a keyboard.

85. (Withdrawn) A universal STB as recited in claim 82, wherein said user interface includes a computer system.

86. (Withdrawn) A universal STB as recited in claim 67, wherein said STB control process is capable of determining the nature of data received in a plurality of channels via information provided in an electronic program guide.

87. (Withdrawn) A universal STB as recited in claim 86, wherein said STB control process is operable to simultaneously tune into two or more of said plurality of channels, and to simultaneously process data from two or more of said plurality of channels.

88. (Withdrawn) A universal STB as recited in claim 87, wherein said STB control process is operable to provide EPG data to a user of said universal STB.

89. (Withdrawn) A universal STB as recited in claim 88, wherein said STB control process is operable to receive and implement instructions from said user of said universal STB.

90. (Withdrawn) A universal STB as recited in claim 89, wherein said STB control process is operable to tune said STB to a first channel in order to select data requested by said user, determine the nature of said selected data, decode said selected data, decompress said selected data, re-assemble said decoded data, store said selected data to said memory, and provide said selected data in a properly processed manner to an output device.